



STATE OF MAINE  
DEPARTMENT OF TRANSPORTATION  
16 STATE HOUSE STATION  
AUGUSTA, MAINE 04333-0016

Paul R. LePage  
GOVERNOR

David Bernhardt  
COMMISSIONER

June 22, 2018  
Subject: Pavement Milling, HMA  
Overlay with Drainage & Safety  
Improvements  
State WINs: 020382.10 & 022855.00  
Location: **Fairfield & Waterville**  
**Amendment No. 2**

Dear Sir/Ms.:

Please make the following changes to the Bid Documents:

In the Bid Book:

**REMOVE** pages 17 – 22, Proposal Schedule of Items, 6 pages, dated 5/27/2018, and  
**REPLACE** with the attached, revised Proposal Schedule of Items, 6 pages, dated 6/20/2018.

**ADD** the attached SPECIAL PROVISION - SECTION 627- PAVEMENT MARKINGS -  
POLYUREA PAVEMENT MARKING, 6 pages, dated January 17, 2017.

Consider these changes and information prior to submitting your bid on **June 27, 2018**.

Sincerely,

George M. A. Macdougall P.E.  
Contracts & Specifications Engineer



PRINTED ON RECYCLED PAPER

## Maine Department of Transportation

## Proposal Schedule of Items

Proposal ID: 020382.10

Project(s): 020382.10, 022855.00

SECTION: 1 HIGHWAY ITEMS

Alt Set ID: Alt Mbr ID:

Contractor: \_\_\_\_\_

Proposal Line Number	Item ID Description	Approximate Quantity and Units	Unit Price		Bid Amount	
			Dollars	Cents	Dollars	Cents
0010	201.11 CLEARING	2.100 AC	_____	 _____	_____	 _____
0020	201.23 REMOVING SINGLE TREE TOP ONLY	17.000 EA	_____	 _____	_____	 _____
0030	202.202 REMOVING PAVEMENT SURFACE	100,000.000 SY	_____	 _____	_____	 _____
0040	202.205 RUMBLE STRIPS - SHOULDER	29,000.000 LF	_____	 _____	_____	 _____
0050	205.512 WIDENING OF EXISTING SHOULDER	625.000 SY	_____	 _____	_____	 _____
0060	403.208 HOT MIX ASPHALT 12.5 MM HMA SURFACE	2,000.000 T	_____	 _____	_____	 _____
0070	403.2081 12.5 MM POLYMER MODIFIED HOT MIX ASPHALT	6,600.000 T	_____	 _____	_____	 _____
0080	403.211 HOT MIX ASPHALT (SHIMMING)	3,000.000 T	_____	 _____	_____	 _____
0090	403.213 HOT MIX ASPHALT 12.5 MM BASE	100.000 T	_____	 _____	_____	 _____
0100	409.15 BITUMINOUS TACK COAT - APPLIED	8,100.000 G	_____	 _____	_____	 _____
0110	410.151 EMULSIFIED ASPHALT SEALCOAT, APPLIED	25,000.000 SY	_____	 _____	_____	 _____
0120	410.25 ASPHALT-RUBBER SURFACE TREATMENT WITH AGGREGATE COVER	50,000.000 SY	_____	 _____	_____	 _____

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			Dollars	Cents	Dollars	Cents
0130	424.323 ASPHALT RUBBER CRACK SEALER, APPLIED	3,000.000 LB	_____	 _____	_____	 _____
0140	424.3333 LOW MODULUS JOINT SEALER, APPLIED	17,000.000 LF	_____	 _____	_____	 _____
0150	424.37 CRACK REPAIR	20,000.000 LF	_____	 _____	_____	 _____
0160	527.301 ENERGY ABSORBING SYSTEM (C-A-T)	1.000 EA	_____	 _____	_____	 _____
0170	603.165 15 INCH REINFORCED CONCRETE PIPE CLASS III	96.000 LF	_____	 _____	_____	 _____
0180	603.195 24 INCH REINFORCED CONCRETE PIPE CLASS III	168.000 LF	_____	 _____	_____	 _____
0190	603.205 30 INCH REINFORCED CONCRETE PIPE CLASS III	64.000 LF	_____	 _____	_____	 _____
0200	603.225 42 INCH REINFORCED CONCRETE PIPE CLASS III	24.000 LF	_____	 _____	_____	 _____
0210	603.55 CONCRETE PIPE TIES	30.000 GP	_____	 _____	_____	 _____
0220	603.7424 REMOVE & RELAY 24 INCH CONCRETE PIPE	16.000 LF	_____	 _____	_____	 _____
0230	605.10 6 INCH UNDERDRAIN OUTLET	10.000 LF	_____	 _____	_____	 _____

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			Dollars	Cents	Dollars	Cents
0240	606.1305 31" W-BM GR, MID-WAY SPLICE FLARED TERMINAL	13.000 EA	_____	 _____	_____	 _____
0250	606.265 TERMINAL END - SINGLE RAIL - GALVANIZED STEEL	5.000 EA	_____	 _____	_____	 _____
0260	606.353 REFLECTORIZED FLEXIBLE GUARDRAIL MARKER	50.000 EA	_____	 _____	_____	 _____
0270	606.356 UNDERDRAIN DELINEATOR POST	11.000 EA	_____	 _____	_____	 _____
0280	606.362 GUARDRAIL ADJUSTED	750.000 LF	_____	 _____	_____	 _____
0290	606.64 GUARDRAIL THRIE BEAM - DOUBLE RAIL	1,925.000 LF	_____	 _____	_____	 _____
0300	606.70 TRANSITION SECTION THRIE BEAM	1.000 EA	_____	 _____	_____	 _____
0310	609.312 SPECIAL CURB	210.000 LF	_____	 _____	_____	 _____
0320	610.08 PLAIN RIPRAP	200.000 CY	_____	 _____	_____	 _____
0330	613.319 EROSION CONTROL BLANKET	2,500.000 SY	_____	 _____	_____	 _____
0340	618.14 SEEDING METHOD NUMBER 2	320.000 UN	_____	 _____	_____	 _____
0350	619.12 MULCH	320.000 UN	_____	 _____	_____	 _____

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			Dollars	Cents	Dollars	Cents
0360	619.14 EROSION CONTROL MIX	75.000 CY	_____	 _____	_____	 _____
0370	620.58 EROSION CONTROL GEOTEXTILE	400.000 SY	_____	 _____	_____	 _____
0380	627.18 12 " SOLID WHITE PAVEMENT MARKING	4,000.000 LF	_____	 _____	_____	 _____
0390	627.30 GROOVING FOR PAVEMENT MARKING	22,000.000 SF	_____	 _____	_____	 _____
0400	627.744 6" WHITE OR YELLOW PAINTED PAVEMENT MARKING LINE	25,000.000 LF	_____	 _____	_____	 _____
0410	627.745 6" WHITE OR YELLOW POLYUREA PAVEMENT MARKING LINE (RECESSED)	45,000.000 LF	_____	 _____	_____	 _____
0420	627.78 TEMPORARY 4 INCH PAINTED PAVEMENT MARKING LINE, WHITE OR YELLOW	50,000.000 LF	_____	 _____	_____	 _____
0430	627.781 TEMPORARY 6 INCH PAINTED PAVEMENT MARKING LINE, WHITE OR YELLOW	200,000.000 LF	_____	 _____	_____	 _____
0440	627.941 PREFORMED THERMOPLASTIC PAVEMENT MARKING	125.800 SF	_____	 _____	_____	 _____
0450	629.05 HAND LABOR, STRAIGHT TIME	100.000 HR	_____	 _____	_____	 _____

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Proposal Line Number	Item ID Description	Approximate Quantity and Units	Unit Price		Bid Amount	
			Dollars	Cents	Dollars	Cents
0460	631.12 ALL PURPOSE EXCAVATOR (INCLUDING OPERATOR)	250.000 HR	_____	 _____	_____	 _____
0470	631.122 MINI ALL-PURPOSE EXCAVATOR (INCLUDING OPERATOR)	10.000 HR	_____	 _____	_____	 _____
0480	631.133 SKID STEER (INCLUDING OPERATOR)	10.000 HR	_____	 _____	_____	 _____
0490	631.14 GRADER (INCLUDING OPERATOR)	30.000 HR	_____	 _____	_____	 _____
0500	631.172 TRUCK - LARGE (INCLUDING OPERATOR)	500.000 HR	_____	 _____	_____	 _____
0510	631.18 CHAIN SAW RENTAL (INCLUDING OPERATOR)	5.000 HR	_____	 _____	_____	 _____
0520	631.29 ROTOTILLER (INCLUDING OPERATOR)	30.000 HR	_____	 _____	_____	 _____
0530	639.18 FIELD OFFICE TYPE A	1.000 EA	_____	 _____	_____	 _____
0540	645.306 FLEXIBLE REFLECTORIZED DELINEATOR	122.000 EA	_____	 _____	_____	 _____
0550	645.511 FLASHING WARNING SIGN	1.000 EA	_____	 _____	_____	 _____
0560	652.30 FLASHING ARROW BOARD	4.000 EA	_____	 _____	_____	 _____
0570	652.33 DRUM	295.000 EA	_____	 _____	_____	 _____

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			Dollars	Cents	Dollars	Cents
0580	652.34 CONE	375.000 EA	_____	 _____	_____	 _____
0590	652.35 CONSTRUCTION SIGNS	3,025.000 SF	_____	 _____	_____	 _____
0600	652.36 MAINTENANCE OF TRAFFIC CONTROL DEVICES	81.000 CD	_____	 _____	_____	 _____
0610	652.38 FLAGGER	200.000 HR	_____	 _____	_____	 _____
0620	652.41 PORTABLE CHANGEABLE MESSAGE SIGN	9.000 EA	_____	 _____	_____	 _____
0630	652.45 AUTOMATED TRAILER MOUNTED SPEED LIMIT SIGN	2.000 EA	_____	 _____	_____	 _____
0640	652.46 SEQUENTIAL FLASHING WARNING LIGHTS	20.000 EA	_____	 _____	_____	 _____
0650	652.47 TEMPORARY PORTABLE RUMBLE STRIP	3.000 GP	_____	 _____	_____	 _____
0660	656.75 TEMPORARY SOIL EROSION AND WATER POLLUTION CONTROL	LUMP SUM	_____	 LUMP SUM	_____	 _____
0670	659.10 MOBILIZATION	LUMP SUM	_____	 LUMP SUM	_____	 _____
<b>Section: 1</b>			<b>Total:</b>		_____	 _____
			<b>Total Bid:</b>		_____	 _____

**SPECIAL PROVISION**  
**SECTION 627- PAVEMENT MARKINGS**  
**POLYUREA PAVEMENT MARKING**

627.01 Description This work shall consist of furnishing and placing reflectorized pavement lines and markings, removing pavement lines and markings, and furnishing and applying reflectorized paint to curbing in reasonably close conformity with the plans and as designated.

The liquid marking material shall be applied by spray method onto asphalt cement concrete and Portland cement concrete surfaces. Following an application of retroreflective optics, and upon curing, the resulting marking shall be an adherent reflectorized stripe during dry and wet conditions of the specified thickness and width that is capable of resisting deformation by traffic.

Work under these items shall consist of the furnishing and installation of white and lead-free yellow polyurea reflectorized pavement markings (including edge lines, center lines, skip lines, cross walks, stop bars and symbols) on all pavement surfaces noted on the plans.

627.02 Materials Materials shall conform to the requirements specified in the following Sections of Division 700 – Materials.

Pavement Marking Paint	708.03
Reflectorized Plastic Pavement Marking	712.05

Temporary Bi-directional Yellow Delineators shall be Temporary Object Markers (T.O.M.) as manufactured by the Davidson Plastic Company, 18726 East Valley Highway, Kent, WA 98031 or an approved equal.

627.02.1 Polyurea Material Contractor shall use a polyurea paint that is classified as VERY FAST CURING POLYUREA TRAFFIC PAINT (no-track times < 10 minutes). The following paint or an approved equal shall be used:

- Innovative Performance Systems HPS-5, Ph. 800.448.3482
- Epoplex LS-90, Ph. 800.822.6920
- 3M Series 5000 LPM, Ph. 800.553.1380

At least one component shall be composed of secondary amines, pigments and fillers as needed to meet performance requirements of this specification.

These films shall be manufactured without the use of lead chromate pigments or other similar, lead-containing chemicals.

The white polyurea shall contain not less than 13% by weight rutile titanium dioxide pigment to ensure adequate opacity, hiding power and reflective properties.

The reflective media must include a first drop of 3M Series 90 elements and second drop of Swarco 18/50 beads (former Utah Performance) bead blend based on manufacturers recommended drop rates. These beads and elements shall be for drop-on application applied simultaneously with paint by pressurized or mechanical means.

627.03 General The pavement markings shall be applied in accordance with the Manual on Uniform Traffic Control Devices.

Longitudinal lines placed on tangent roadway segments shall be straight and true. Longitudinal lines placed on curves shall be continuous smoothly curved lines consistent with the roadway alignment. All pavement markings placed shall meet the tolerance limits shown on the plans.

Broken lines shall consist of alternate 15 foot painted line segments and 25 foot gaps.

Temporary pavement marking lines, defined in Special Provision Section 652, Maintenance of Traffic, Temporary Centerline, will be applied as many times as necessary to properly delineate traffic lanes for the safe passage of traffic. If allowed under the contract, Bi-directional delineators may be used in place of temporary lines, except where specified otherwise in Special Provision 652 Maintenance of Traffic, Temporary Centerline. Delineators will be applied at 40 foot intervals.

Newly painted lines, markings and curb shall be protected from traffic by the use of cones, stationary vehicles or other approved methods until the paint is dry.

627.02.1 Polyurea Marking Polyurea Marking equipment shall be certified by the manufacturer as suitable for the application of the polyurea and reflective media. The striping equipment shall bear a decal identifying it as manufacturer certified.

At any time throughout the duration of the project, the Contractor shall provide free access to his application equipment for inspection by the Engineer, his authorized representative, or the materials representative.

627.04 Polyurea Performance Requirements The preformed markings shall consist of white and yellow films with pigments selected and blended to conform to standard highway colors.

The mixed polyurea compound, both white and yellow, when applied to a 3<sup>2</sup> x 6<sup>2</sup> aluminum panels at 15±3 mil in thickness with no glass beads and exposed for 500 hours in a Q.U.V. Environmental Testing Chamber, as described in ASTM G-154, Cycle #1, shall conform to the following minimum requirements. The color of the white polyurea system shall not be darker than Federal Standard No. 595A-17778. The color of the yellow polyurea system shall be reasonably close to Federal Standard No. 595A-13538.

The surface of the retroreflective marking shall provide an initial average skid resistance value of 45 BPN when tested according to ASTM E303.

When tested in accordance with ASTM D-711 the polyurea marking material shall reach a track-free condition in 7 minutes or less at 15 mils with no retroreflective material.

When installed at 77° F, at a wet film thickness of 22±1 mils and reflectorized with glass beads, the polyurea markings shall reach a no-track condition in less than 6 minutes. Dry to “no-tracking” shall be considered as the condition where no visual deposition of the polyurea marking to the pavement surface is observed when viewed from a distance of 50 feet, after a traveling vehicle’s tires have passed over the line.

The polyurea pavement marking materials, when tested according to ACI Method 503, shall demonstrate 100% concrete failure in the performance of this test. The prepared specimens shall be conditioned at room temperature (75° ± 2° F) for a minimum of 24 hours and maximum of 72 hours prior to the performance of the tests indicated.

The polyurea pavement marking materials, when tested according to ACI Method 503, shall demonstrate 100% asphalt failure in the performance of this test. The prepared specimens shall be conditioned at room temperature (75° ± 2° F) for a minimum of 24 hours and maximum of 72 hours prior to the performance of the tests indicated.

The material shall have a minimum Shore D Hardness of between 70 and 100 when tested in accordance with ASTM D 2240.

The material shall have a maximum abrasion resistance of 150 mg at 15 ± 1 mil (0.375 ± 0.025 mm) when tested in accordance with ASTM D-4060 (formally ASTM C 501).

The Contractor shall furnish a certificate of compliance showing the Polyurea material conforms to all requirements of this specification.

627.05 Preparation of Surface At the time of Polyurea application all pavement surfaces shall be free of moisture, oil, dirt, dust, grease and similar foreign materials. In addition, concrete curing compounds on new Portland cement concrete surfaces and existing pavement markings on both concrete and asphalt surfaces shall be removed. The Contractor shall clean the pavement surface to the satisfaction of the Engineer and the Material Manufacturer.

The grooved surface is air-blasted to remove any dirt and residues if present.

Polyurea markings shall only be applied during conditions of dry weather and subsequently dry pavement surfaces. At the time of installation the pavement surface temperature and the ambient temperature shall be above 32° F. The Engineer shall determine the atmospheric conditions and pavement surface conditions that produce satisfactory results.

627.06 Application All work shall be done in accordance with the Material Suppliers specifications and the following:

1. The polyurea binder shall be applied at rates to achieve a minimum uniform wet thickness of  $25 \pm 2$  mils.
2. Prior to grinding out the grooves for all recessed lines, the Contractor shall use a chalk line or other suitable method to layout the proposed pavement markings on the surface course so that the Resident can inspect the locations. Once the Resident has inspected and approved the proposed striping layout, the grooves for the proposed pavement markings may be ground out. No pavement grinding shall be done without the prior approval of the Resident.
3. Item 627.734 for edge lines, centerlines and skip lines shall be applied into a  $4\text{-}3/4$  inch  $\pm 1/4$  inch wide x 45 90 mils  $\pm 5$  mils deep RECESSED groove.
4. Item 627.745 for edge lines, centerlines and skip lines shall be applied into a  $6\text{-}3/4$  inch  $\pm 1/4$  inch wide x 45 90 mils  $\pm 5$  mils deep RECESSED groove.
5. The recessed groove for all polyurea locations shall be constructed in accordance with the polyurea manufacturer's recommended procedures. Particular attention shall be paid to the smooth surface texture. The acceptability of the surface texture will be decided by the Resident and/or Manufacturer's Technical Representative. A two (2) inch offset from the edge of the recessed groove to the longitudinal surface course pavement joint is desirable.
6. Marking Performance: The typical dry average initial retroreflectance of the markings shall be 600 [(mcd(ft-2)(fc-1)] for white and 400 [(mcd(ft-2)(fc-1)] for yellow per ASTM E1710. The typical wet average initial retroreflectance of the markings shall be 375 [(mcd(ft-2)(fc-1)] for white and 275 [(mcd(ft-2)(fc-1)] for yellow per ASTM E2177.

The average initial retroreflectance shall be determined according to the measurement and sampling procedures outlined in ASTM D 6359, using a 30 meter retroreflectometer. The 30 meter retroreflectometer shall measure the coefficient of retroreflected luminance, RL, at an observation angle of 1.05 degrees and an entrance angle of 88.76 degrees. RL shall be expressed in units of millicandelas per square foot per foot-candle [(mcd(ft-2)(fc-1)]. The metric equivalent shall be expressed in units of millicandelas per square yard per lux [mcd(m-2)(lux-1)].

627.07 Installation The initial performance of the pavement markings shall be measured within seven (7) days after application. Measurements shall also be made six (6) and twelve (12) months after application for data purposes only.

Using the application equipment, the pavement markings shall be applied in the following manner as a simultaneous operation:

Temporary pliant polymer marking material shall be used for temporary markings on the final pavement and on pavements not to be resurfaced when such pavement markings do not conform to the final pavement markings pattern.

The resin, mixed and heated in accordance with the manufacturer's recommendations, is sprayed onto the pavement surface. The specified reflective media is dropped onto the liquid marking.

627.07.1 Polyurea Groove Specifications The Polyurea marking shall be placed in a groove with a minimum depth of 90 mils and a maximum depth of 110 mils. The groove width shall be 1 inch wider than the specified marking width.

Cutting blades shall be gang stacked diamond tipped. The spacers between each blade must be such that there is less than a 10 mil rise in the finish grade between the blades giving the finished surface a smooth appearance.

Pavement shall be sufficiently dry during the grooving operation to prevent asphalt grindings from bonding together thereby preventing the groove from being cleaned completely.

The edge of the groove shall not be closer than 2 inches from any pavement joint.

627.08 Establishment Period As work incidental to these items, the Contractor or polyurea Material Supplier shall measure the performance of the pavement markings upon installation, at 6 months, and at 12 months after application and report to the Resident.

If the polyurea striping does not meet the average retroreflectance noted above measured (at installation) the Contractor shall replace all unsatisfactory polyurea pavement marking lines and pavement markings on the project without additional payment.

Replacement of pavement markings lines and pavement markings will require regrooving of the area, without additional payment. Pavement marking lines and pavement markings replaced at the end of the 12 month establishment period will not be subject to a further establishment period.

627.09 Removing Lines and Markings When it is necessary to remove pavement lines and markings, it shall be done by high pressure water, sand blasting, or other acceptable means. The method chosen must be capable of completely eradicating the existing line or marking without damage to the pavement. Burning and grinding to remove temporary markings from final pavement or from existing pavement not to be resurfaced will not be permitted.

627.10 Method of Measurement The quantity of permanent pavement marking lines measured for payment will be the number of feet shown in the Schedule of Items in the contract.

Double yellow centerline, broken or solid, will be considered one line for measurement purposes. The measurement of broken lines will include the gaps when painted and will not include the gaps when plastic. Temporary pavement marking lines will be measured as one lump sum for work accepted. All other pavement markings will be measured by the square foot for work actually done.

Reflectorized curb will be measured or computed by the square foot of curb surface actually painted and reflectorized.

The accepted quantity of removing existing pavement markings will be measured by the square foot.

Polyurea Pavement Marking Lines (Recessed) shall be measured by the linear foot and will include the gaps of broken and dotted lines.

Polyurea Pavement Markings (Recessed) shall be measured by the square foot.

627.11 Basis of Payment The accepted quantity of permanent pavement marking lines will be paid for at the contract unit price per foot. No adjustment will be made to the quantity for payment, except as described under Method of Measurement above. All other permanent pavement markings will be paid for at the contract unit price per square foot.

Payment for final plastic pavement lines and markings will be made in two parts. The first payment of 75% will be made when plastic pavement lines and markings are placed. The payment for the remaining 25% will be made at the end of the establishment period for all plastic lines and pavement markings accepted.

The accepted quantity of temporary pavement marking lines will be paid for at the contract price and will include as many applications as required and removal when required. If allowed by Special Provision, the Contractor may utilize Temporary Bi-Directional Yellow and White (As required).

Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
627.734 4" White or Yellow Polyurea Pavement Marking Line (Recessed)	Linear Foot
627.745 6" White or Yellow Polyurea Pavement Marking Line (Recessed)	Linear Foot
627.751 White or Yellow Polyurea Pavement Markings (Recessed)	Square Foot